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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/646,198	09/14/2000	Mitsuji Matsui	1419-00	5728

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EXAMINER	
UHLIR, NIKOLAS J	
ART UNIT	**PAPER NUMBER**
1773	6

DATE MAILED: 07/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-4

Office Action Summary	Application No.	Applicant(s)	
	09/646,198	MATSUI ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) 1-16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-5 and 10-16 is/are rejected.

7)☒ Claim(s) 6-9 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claims 6-9 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 1 recites the limitation "to form a casting having pinholes generated in a casting surface, the pinholes being suppressed to generate so as to meet a predetermined condition." It is unclear to the examiner what exactly the applicant means by "the pinholes being suppressed to generate."

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5 and 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaumle et al. (US6068890) in view of Sakota et al. (JP07328245), further in view of Nishimura et al. (JP08041410).

8. For the purpose of this examination, the examiner has relied upon machine translations of the Nishimura et al. and Sakota et al. documents. A copy of these machine translations accompanies this office action, along with the original Japanese.

9. Kaumle et al. teaches a method for gloss coating articles of manufacture, in particular vehicle parts such as wheels or rims (column 1, lines 10-15). Kaumle et al. specifically teaches a method for coating an aluminum or aluminum alloy wheel, wherein the method comprises the following steps: 1. Providing the metal wheel. 2. Mechanically polishing the surface of the metal wheel. 3. Coating the smoothed surface with a process optimized powder (a powdered paint) finish. 4. Coating the process optimized powder layer with a glossy metal/metal alloy layer via magnetron sputtering. 5. Coating the glossy metal/metal alloy layer with a polyurethane topcoat (column 5, line 55-column 6, line 16). The process optimized powdered base coat (also referred to as a polishing paint layer) is preferably between 30-300μm thick. The glossy metal/metal alloy layer is preferably 100-500nm thick, and the transparent topcoat layer is preferably 20-30μm thick (column 3, lines 12-46). Kaumle et al. specifically teaches that wheels that are manufactured via casting or forging typically exhibit relatively high surface roughness. The processed optimized powder/ powder paint layer is provided so as to

reduce the roughness of the surface upon which the glossy metal/metal alloy layer is deposited. This reduction in surface roughness increases the adhesion strength of the metal/metal alloy layer (column 5, lines 9-18). Thus, the examiner takes the position that the surface roughness of the alloy wheel is a results effective variable, and it would have been obvious to one with ordinary skill in the art to optimize the surface roughness to the specified values, specifically 6.3 μm Rmax or <1.6μm Rmax in order to achieve a desired level of coating adhesion.

10. Kaumle et al. does not teach a method for manufacturing a light metal casting, specifically a light metal (aluminum or aluminum alloy) wheel, wherein the method comprises casting the light metal under a casting pressure greater than 50Mpa applied by a pressurizing pin, thereby resulting in a casting having pinholes generated in the casting surface, wherein the number of pinholes is between 1-10/100cm^2, the pinholes have a maximum opening dimension of not more than 2mm, and the number of pinholes having a maximum opening dimension between 1-2mm is 1 or 0. Last, Kaumle et al. also does not teach a light metal casting that is polished via barrel finishing.

11. Sakota et al. teaches a method for manufacturing a cast aluminum alloy wheel. This method includes the following steps: 1. Providing a molten aluminum alloy. 2. Degassing the molten aluminum alloy with argon gas, such that the concentration of hydrogen gas in the molten alloy is below .2cc/100g. 3. Injecting the molten alloy into a die. 4. Solidifying the molten alloy under a pressure greater than 500kgf/cm^2 (>50Mpa) (sections 19-22). Sakota et al. specifically teaches that the alloy is degassed so as to inhibit the formation of blowholes in the casting surface (section 19). Sakota et al. also

teaches that if the alloy is cast under a pressure less than 500kgf/cm^2 (as is typically done in the art), the casting frequent exhibits cracking, along with a substantial decrease in mechanical properties (section 0022).

12. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to use manufacture the aluminum or aluminum alloy wheel taught by Kaumle et al. via the high pressure casting method taught by Sakota et al.

13. One would have been motivated to make this modification due to the teaching in Sakota et al. that aluminum wheels made via the high pressure method inhibit the formation of blowholes and exhibit less cracking then aluminum wheels manufactured at lower pressure.

14. Nishimura et al. teaches a method for polishing an aluminum wheel via barrel polishing (abstract). This method is typically used to pretreat the surface of a aluminum alloy wheel prior to the wheel surface being coated with a plating or paint material (section 38) Nishimura et al. teaches that shot peening is conventionally used in the art to polish aluminum wheels, but results in a relatively rough surface that is undesirable and inhibits the adhesion of subsequent plating or paint coatings that are applied to the wheel surface (section 4). Nishimura et al. teaches that if an aluminum wheel is polished via barrel finishing as opposed to shot peening, the surface roughness of the wheel can be reduced beyond that which is achievable via a shot peening method (section 7). Referring to tables 1-4, Nishimura et al. presents several examples that exhibit a surface roughness as low as 2.8μm and as high as 12.6.

15. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to utilize the barrel polishing method taught by Nishimura et al. to smooth the surface of the alloy wheel taught by Kaumle et al. as modified by Sakota et al.

16. One would have been motivated to make this modification due to the teaching in Kaumle et al. that decreasing the surface roughness of an aluminum wheel increases the adhesion of subsequent coatings that are applied to the wheel surface, and the teaching in Nishimura et al. that barrel polishing can achieve significantly lower surface roughness than a standard shot peening method, which is the most common wheel polishing method known in the art.

17. Regarding claims 1-4 and 14, wherein the applicant requires that the light-metal casting have small pinholes in its surface, wherein the number of pinholes is less then 10 per $100cm^2$, have a maximum open diameter of 2mm, and the number of pinholes having a maximum open diameter between 1-2mm is 1 or 0. Although Kaumle et al. as modified by Sakota et al. and Nishimura et al. do not specifically disclose these requirements, the examiner takes the position that these limitations are met. Kaumle et al. as modified by Satoka et al. and Nishimura et al. manufactures a wheel from a similar or in some case identical light metal (aluminum or aluminum alloy), via the same method (casting), under high (>50Mpa) pressure. Thus, because the wheel described by Kaumle et al. as modified by Satoka et al. and Nishimura et al. is manufactured via the same method and with the same materials as the applicant, the examiner takes the position that the pinhole limitations required by claims 1-4 and 14 are necessarily met.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700

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July 16, 2002